WHAT IS CLAIMED IS:

1. A method of detecting binding between a putative ligand and a selectively labeled target molecule, wherein the target molecule comprises a plurality of amino acid moieties including at least one tryptophan moiety, and wherein the tryptophan moiety is labeled, which method comprises: a) generating a first NMR spectrum of said target molecule; b) forming a mixture of said target molecule with at least one putative ligand; c) generating a second NMR spectrum of the mixture of step (b); and d) comparing the first and second spectra.

2. The method of claim 1, wherein the tryptophan moiety is labeled with a nuclei selected from the group consisting of ^{1}H, ^{13}C, ^{15}N, ^{19}F.

3. The method of claim 1, wherein the selectively labeled target molecule is selected from the group consisting of lipoproteins, lipoprotein fragments, glycoproteins, glycoprotein fragments, proteins, protein fragments, and polypeptides.

4. The method of claim 3, wherein the selectively labeled target molecule is selected from the group consisting of proteins, protein fragments, and polypeptides.

5. A method of producing a selectively labeled target molecule comprising culturing a transformed cell line containing an expression vector comprising a polynucleotide encoding the target molecule in a medium comprising a labeled tryptophan precursor or a labeled tryptophan moiety.

6. A method of producing a selectively labeled target molecule comprising culturing a transformed cell line containing an expression vector comprising a polynucleotide encoding the target molecule in a medium comprising a labeled tryptophan moiety and at least one inhibitor of tryptophan synthesis.

7. The method of claim 6, wherein the labeled tryptophan moiety is labeled with a nuclei selected from the group consisting of ^{1}H, ^{13}C, ^{15}N, ^{19}F.

8. The method of claim 6, wherein the selectively labeled target molecule is selected from the group consisting of lipoproteins, lipoprotein fragments, glycoproteins, glycoprotein fragments, proteins, protein fragments, and polypeptides.

9. The method of claim 8, wherein the selectively labeled target molecule is selected from the group consisting of proteins, protein fragments, and polypeptides.